

The NASA Electronic Parts and Packaging (NEPP) Program – Automotive Electronics

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Outline

- **Acronym List**
- **Why is NASA Interested?**
- **Plans for FY14/FY15**
- **Summary**



<http://static.nme.com/images/article/BackToTheFutureCar600Gb120712.jpg>



Acronyms

Acronym	Definition
AEC	Automotive Electronics Council
AEC	Automotive Electronics Council
BOK	Body of Knowledge
COP	Community of Practice
FY	Fiscal Year
ICs	Integrated Circuits
IP	Intellectual Property
NASA	National Aeronautics and Space Administration
NEPP	NASA Electronic Parts and Packaging
SOC	Systems on a Chip
TI	Texas Instruments



NEPP –

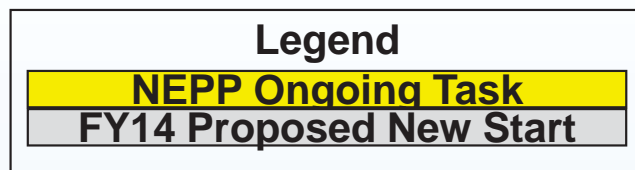
Automotive Electronics Considerations

- As a means of potentially providing a more cost-effective choice of electronics for certain classes of missions, NEPP is evaluating the use of automotive grade electronics.
- NEPP has three tasks in plan:
 - Develop a body of knowledge (BOK) document, highlighting the Automotive Electronics Council (AEC) documents as well as discussions with manufacturers (Mike Sampson, Jay Brusse).
 - Evaluate (reliability) selected automotive grade electronics (in collaboration with Navy Crane).
 - ICs (Shri Agarwal),
 - Capacitors (Jay Brusse), and,
 - Discretes (Benny Damron).
 - Evaluate (radiation/reliability) automotive grade microcontroller (Ken LaBel, acting).
- Overall task area leadership
 - **Mike Sampson**

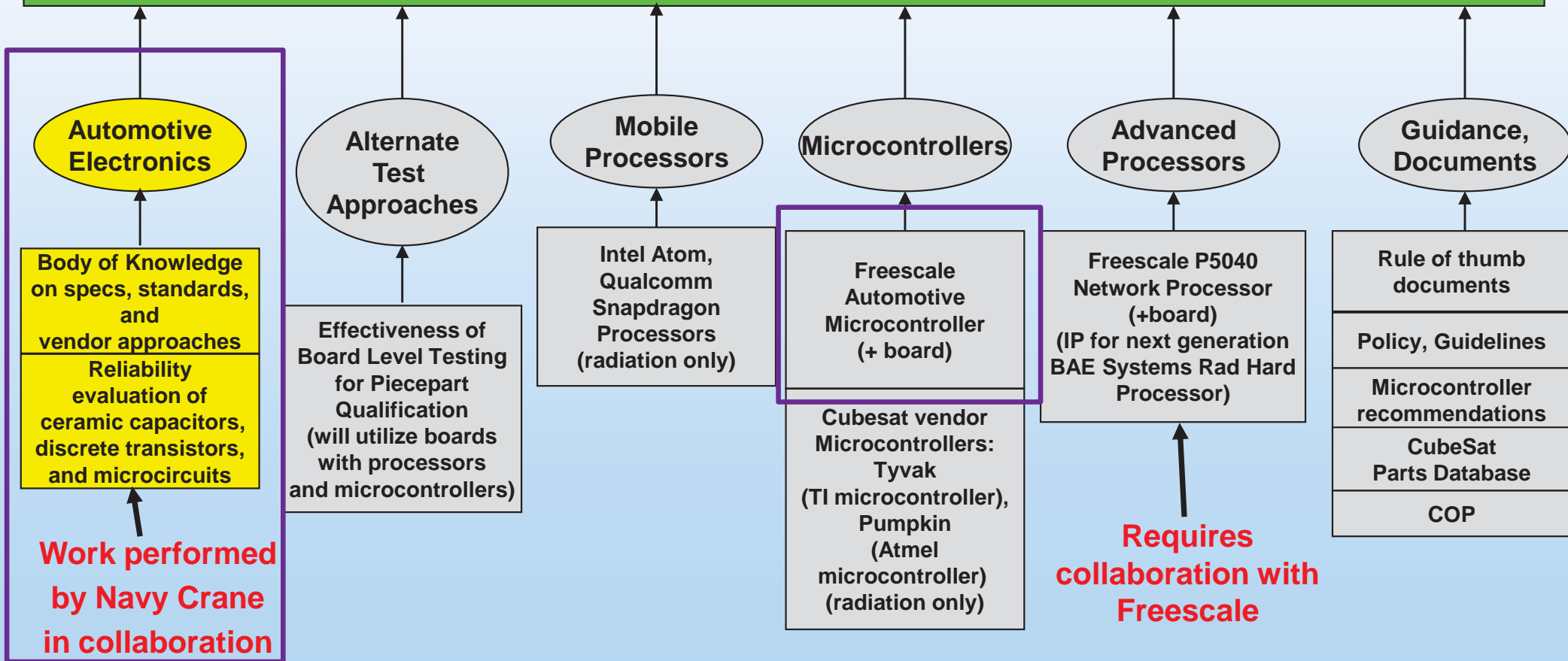


FY14 NEPP Core – Automotive/Commercial Electronics (Small Missions)

Core Areas are Bubbles;
Boxes underneath are variable
tasks in each core



NEPP Research Category – Automotive/Commercial Electronics





Automotive Microcontroller

- **Plan is to utilize automotive grade microcontroller (32-bit, 90 nm) fabricated by Freescale on-shore.**
 - Utilizes same software development tool as future multi-core processors (see Systems on a Chip (SOC) task area).
- **Both radiation and reliability evaluations planned.**
 - Will utilize evaluation boards for radiation tests.
 - Will utilize both piecepart and evaluation boards for reliability tests.
 - Outcome provides comparison between test techniques.
 - Additional active and passive components on evaluation board will be tested.
- **May provide recommendation for usage in instruments/small mission applications.**



Automotive Electronics - Schedule



Plan



Actual



Report

Automotive Electronics

ACTIVITY

PERIODS

J J A S O N D J F M A M

BOK	Plan	Plan	Plan	Plan	Plan	Plan	Report					
Evaluation ICs			Actual	Plan	Plan	Actual						
Evaluation Capacitors		Actual		Actual								
Evaluation Discretes	Plan	Plan	Plan	Plan	Plan	Plan	Actual					
Radiation Microcontroller	Plan	Plan	Plan	Plan	Plan	Plan	Actual					
Reliability Microcontroller		Plan	Plan	Plan	Plan	Plan	Plan	Plan	Actual			

Multiple vendors for ICs, Capacitors, and Discretes



Summary

- **NEPP is exploring possible usage of alternate grade electronics as a means of cost/performance effectiveness.**
- **FY15 plans to begin looking at medical grade.**



**Family member of
microcontroller of interest**

<http://johndayautomotivelectronics.com/freescale-qorivva-mcus-target-next-generation-body-control-and-gateway-applications/>